

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A device comprising:
 - i) a microdroplet transport channel in a silicon substrate, said channel having a depth between 0.35 and 50 μ m, having a width between 50 and 1000 μ m, and connecting to a reaction region; ~~and~~
 - ii) a series of etched aluminum heating elements arrayed along said microdroplet transport channel, wherein said series of heating elements are configured so as to provide differential heating; ~~and~~[[.]]
 - iii) a barrier layer positioned on top of said etched aluminum heating elements, wherein said barrier comprises a first silicon layer, a silicon nitride layer, and a second silicon oxide layer.
2. (Cancel)
3. (Original) The device of Claim 1, wherein said transport channel is treated with a hydrophilicity-enhancing compound.
- 4-5. (Cancel)
6. (Original) The device of Claim 1, further comprising a second microdroplet transport channel in said substrate.
7. (Original) The device of Claim 6, wherein said first and second transport channels are etched in said substrate.
8. (Currently Amended) A system comprising:
 - i) a microdroplet;
 - ii) first and second microdroplet transport channels in a silicon substrate, wherein said channels comprise a first silicon layer, a silicon nitride layer, and a second silicon oxide layer, said channels having a depth between 0.35 and 50 μ m, having a width between 50 and 1000 μ m, and connecting to a reaction region; and
 - iii) a series of etched aluminum heating elements arrayed along said first and second transport channels, wherein said series of heating elements are configured so as to provide differential heating of said microdroplet by said heating elements.

9. (Currently Amended) The system of Claim 8, wherein said microdroplet comprises ~~organic material~~ a biomolecule.
10. (Currently Amended) The system of Claim 9, wherein said ~~organic material~~ biomolecule is selected from the group consisting of proteins, lipids, and nucleic acids.
11. (Original) The system of Claim 8, wherein said first and second transport channels are etched in said substrate.
12. (Cancel)
13. (Currently Amended) A device comprising:
 - i) a first housing portion comprising silicon;
 - ii) a microdroplet transport channel in said first housing portion, wherein said channel comprises a first silicon layer, a silicon nitride layer, and a second silicon oxide layer, said transport channel having a depth between 0.35 and 50 μ m, having a width between 50 and 1000 μ m, and connecting to a reaction region;
 - iii) a second housing portion bonded to and aligned with said first housing portion thus creating an assembled housing, wherein said second housing portion is selected from the group consisting of silicon, quartz or glass; and
 - iv) a series of etched aluminum heating elements in said assembled housing arrayed along said ~~fluid~~ microdroplet transport channel, wherein said series of heating elements are configured so as to provide differential heating.
14. (Cancel)
15. (Previously Presented) The device of Claim 13, wherein said transport channel is treated with a hydrophilicity-enhancing compound.
- 16-17. (Cancel)
18. (Previously Presented) The device of Claim 13, further comprising a second microdroplet transport channel in said first housing.
19. (Previously Presented) The device of Claim 13, further comprising a second series of heating elements arrayed along said second transport channel.

20. (Previously Presented) The device of Claim 13, wherein said first and second transport channels are etched in said first housing.
21. (New) A device comprising:
- i) a microdroplet transport channel in a silicon substrate, said channel having a depth between 0.35 and 50 μ m, having a width between 50 and 1000 μ m, and connecting to a reaction region;
 - ii) a series of etched aluminum heating elements arrayed along said microdroplet transport channel, wherein said series of heating elements are configured so as to provide differential heating, and
 - iii) a barrier layer positioned on top of said etched aluminum heating elements, wherein said barrier is impermeable to an aqueous solution.
22. (New) The device of Claim 21, wherein said transport channel is treated with a hydrophilicity-enhancing compound.
23. (New) The device of Claim 21, further comprising a second microdroplet transport channel in said first housing.
24. (New) The device of Claim 21, further comprising a second series of heating elements arrayed along said second transport channel.
25. (New) The device of Claim 21, wherein said first and second transport channels are etched in said first housing.